What is Claimed is:

[c1] 1. A method for determining an uplink transmit power level at which to transmit a current data block over a radio link from at least one of a plurality of mobile stations to a base transmitter station, comprising:

(a) evaluating airlink quality measurements within the radio link over a measurement interval, wherein each time a message is sent to the mobile station, it is evaluated whether a specified number of uplink blocks have been transmitted by the mobile station since the start of the measurement interval; and

(b) determining a transmit power level that the mobile should be using for the current block based on the evaluated airlink quality measurement, wherein transmit power is adjusted for the current block, if necessary, based on the determined transmit power.

[c2] 2. The method of claim 1, wherein the base transmitter station and mobile stations are part of a general packet radio service (GPRS) system.

[c3] 3. The method of claim 1, wherein said step (b) further includes using bit error rate (BER)-based and block error rate (BLER)-based power step calculation techniques to determine how much to adjust the mobile station's transmit power.

[c4] 4. The method of claim 3, wherein the BER-based power control step $\Delta_{BER}(s)$, which represents the excess power being used by the mobile station, is determined for each mobile station uplink TBF on a time slot *s*.

[c5] 5. The method of claim 4, wherein $\Delta_{BER}(s)$ is determined from the following equation:

$$\Delta(s) = \frac{1}{\mu}\log\left(\frac{n_1(s)b_1 + n_2(s)b_2 + n_3(s)b_3 + n_4(s)b_4}{\hat{b}(s)}\right),$$

where μ represents a slope of a log(BER) versus C/I (dB) plot at time slot s, $\hat{b}(s)$ represents the expected number of bit errors in a given measurement interval at time slot s, $n_j(s)$ represents the number of RLC blocks received from the mobile station on time slot *s* that which were not in error, and $b_j(s)$ is the target number of bit errors per RLC block for the mobile station at time slot *s*.

[c6] 6. The method of claim 3, wherein the BLER-based power control step $\Delta_{BLER}(s)$, which represents the excess power being used by the mobile station, is determined for each mobile station uplink TBF on a time slot s.

[c7] 7. The method of claim 6, wherein $\Delta_{BLER}(s)$ is determined from the following equation:

$$\Delta(s) = \frac{-k_{sum}(s) + \left(N_1(s)B_1 + N_2(s)B_2 + N_3(s)B_3 + N_4(s)B_4\right)}{N_1(s)\beta_1 + N_2(s)\beta_2 + N_3(s)\beta_3 + N_4(s)\beta_4},$$

where $k_{sum}(s)$ is the total number of RLC blocks received from the mobile station on time slot s which were in error, $N_j(s)$ represents the number of RLC blocks received from the mobile station on time slot s during the measurement interval, $B_j(s)$ is the target block error rate for the mobile station at time slot s, and β_j represents the slope of a BLER versus C/I (dB) plot at time slot s.

[c8] 8. The method of claim 3,

wherein if a calculated power reduction step results in an increase in mobile transmit power, the mobile is commanded to increase its transmit power by the total power step, and

wherein if the calculated power reduction step results in a decrease in mobile transmit power, the mobile is commended to reduce its power by a fraction of the calculated power step.

[c9] 9. The method of claim 8, wherein reducing the transmit power by only a fraction of the calculated step provides a method that is robust to estimation errors and to short term fluctuations in channel quality of the mobile station.

[c10] 10. The method of claim 1, wherein step (a) further includes

(a1) assessing the received quality of individual RLC blocks in the base transceiver station, and if the quality is very poor within a first polling interval, sending a message commanding a higher mobile transmit power from the mobile station.

[c11] 11. The method of claim 1, further comprising (c) transmitting the current block at the adjusted transmit power level.

[c12] 12. The method of claim 10, wherein step (a1) further includes determining whether to send a message or not by determining whether the total number of block errors in the RLC blocks is greater than or equal to a predetermined parameter, and if so, sending a message commanding higher mobile transmit power from the mobile station.

[c13] 13. The method of claim 1, wherein the method employs no timers, but is driven or initiated by at least one external event selected from the group comprising temporary block flows (TBF), receipt of an uplink block of data, transmission of a packet uplink acknowledgement/negative acknowledgement message, transmission of a TBF reassignment message, and termination of a TBF.

[c14] 14. The method of claim 1, wherein step (b) further includes an expediting procedure to more quickly determine the initial uplink transmit power of the mobile station by monitoring the quality of the first several uplink blocks sent on a temporary block flow (TBF) in order to determine if the initial uplink transmit power commanded by the base transmitter station at the start of the TBF is too low.

[c15] 15. The method of claim 14, wherein the expediting procedure is controlled by a single flag indicating whether the expediting procedure is enabled or not.

[c16] 16. A base transmitter station in a general packet radio system (GPRS), comprising:

a transceiver for transmitting and receiving data packets to and from a plurality of mobile stations; and

a processor which determines the uplink transmit power to be used by at least one mobile station before transmitting its uplink block to the base transmitter station.

[c17] 17. The base transmitter station of claim 16, wherein said processor includes a power control application

for evaluating airlink quality measurements within the link between mobile and base station over a measurement interval, wherein each time a message is sent to the mobile station, it is evaluated whether a specified number of uplink blocks have been transmitted by the mobile station since the start of the measurement interval; and

for determining a transmit power level that the mobile should be using for the current block based on the evaluated airlink quality measurement, wherein transmit power is adjusted for the current block, if necessary, based on the determined transmit power.

[c18] 18. The base transmitter station of claim 17, wherein said power control application uses bit error rate (BER)-based and block error rate (BLER)-based power step calculation techniques to determine how much to adjust the mobile station's transmit power.

[c19] 19. The base transmitter station of claim 18, wherein the BER-based power control step $\Delta_{BER}(s)$, which represents the excess power being used by the mobile station, is determined for each mobile station uplink TBF on a time slot *s*.

[c20] 20. The base transmitter station of claim 19, wherein $\Delta_{BER}(s)$ is determined from the following equation:

$$\Delta(s)=\frac{1}{\mu}\log\left(\frac{n_1(s)b_1+n_2(s)b_2+n_3(s)b_3+n_4(s)b_4}{\hat{b}(s)}\right),$$

where μ represents a slope of a log(BER) versus C/I (dB) plot at time slot s, $\hat{b}(s)$ represents the expected number of bit errors in a given measurement interval at time slot s, $n_j(s)$ represents the number of RLC blocks received from the mobile station on time slot *s* that which were not in error, and $b_j(s)$ is the target number of bit errors per RLC block for the mobile station at time slot *s*.

[c21] 21. The base transmitter station of claim 18, wherein the BLER-based power control step $\Delta_{BLER}(s)$, which represents the excess power being used by the mobile station, is determined for each mobile station uplink TBF on a time slot s.

[c22] 22. The base transmitter station of claim 21, wherein $\Delta_{BLER}(s)$ is determined from the following equation:

$$\Delta(s)=\frac{-k_{sum}(s)+\left(N_1(s)B_1+N_2(s)B_2+N_3(s)B_3+N_4(s)B_4\right)}{N_1(s)\beta_1+N_2(s)\beta_2+N_3(s)\beta_3+N_4(s)\beta_4},$$

where $k_{sum}(s)$ is the total number of RLC blocks received from the mobile station on time slot s which were in error, $N_j(s)$ represents the number of RLC blocks received from the mobile station on time slot s during the measurement interval, $B_j(s)$ is the target block error rate for the mobile station at time slot s, and β_j represents the slope of a BLER versus C/I (dB) plot on time slot s.

[c23] 23 The base transmitter station of claim 18,

wherein if a calculated power reduction step results in an increase in mobile transmit power, the processor sends a command to the mobile station to increase its transmit power by the total power step, and

wherein if the calculated power reduction step results in a decrease in mobile transmit power, the processor sends a command to the mobile station to reduce its power by a fraction of the calculated power step.

[c24] 24. The base transmitter station of claim 17, wherein said power control application assesses the received quality of individual RLC blocks received from the mobile stations, and if the quality is very poor within a first polling interval, the processor sends a message commanding a higher mobile transmit power from the mobile station.

[c25] 25. The base transmitter station of claim 17, wherein the power control application employs no timers, but is driven or initiated by at least one external event selected from the group comprising temporary block flows (TBF), receipt of an uplink block of data, transmission of a packet uplink acknowledgement/negative acknowledgement message, transmission of a TBF reassignment message, and termination of a TBF.

[c26] 26. The base transmitter station of claim 17, wherein the power control application includes an expediting procedure to more quickly determine the initial uplink transmit power of the mobile station by monitoring the quality of the first several uplink blocks sent on a temporary block flow (TBF) in order to determine if the initial uplink transmit power commanded by the base transmitter station at the start of the TBF is too low.

[c27] 27. The base transmitter station of claim 26, wherein the power control application controls the expediting procedure based on a single flag indicating whether the expediting procedure is to be enabled or not.

[c28] 28. In a general packet radio system (GPRS), a closed-loop power control method requiring interaction between a first algorithm and a second algorithm,

wherein the first algorithm informs the second algorithm about a weakest coding scheme that is to be used over an airlink, in a next measurement interval, between at least one target mobile station and a base station of the system, and

wherein the second algorithm selects target mobile bit error rate (BER) or target mobile carrier-to-interference level (C/I) based on the information from the first algorithm, and sets a flag for when attenuation to be used in said next measurement interval exceeds a preset threshold.

[c29] 29. The closed-loop power control method of claim 28, wherein said coding schemes used by the first algorithm are selected from one of CS-1, CS-2, CS-3 and CS-4 GPRS coding schemes.

[c30] 30. The closed-loop power control method of claim 29, wherein a set flag indicates that target mobile transmit power is low, so that the first algorithm uses high throughput coding schemes CS-3 and CS-4.

[c31] 31. The closed-loop power control method of claim 29, wherein an unset flag indicates that target mobile transmit power is high, so that the first algorithm is limited to low throughput coding schemes CS-1 and CS-2.

[c32] 32. The closed-loop power control method of claim 28, wherein the method maintains uplink channel BER of the mobile within a desired range by commanding the target mobile to decrease its transmit power where target BER is below the desired range, and by commanding the target mobile to increase its transmit power where target BER is above the desired range.